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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,643	04/12/2004	Michio Nemoto	FUJI:303	1942
7590 07/01/2005				
ROSSI & ASSOCIATES P.O. Box 826 Ashburn, VA 20146-0826		EXAMINER SEFER, AHMED N		
		ART UNIT 2826		
DATE MAILED: 07/01/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/822,643

Applicant(s)

NEMOTO ET AL.

Examiner

A. Sefer

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 5-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/12/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Claims 6-12 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species and claim 5 (which does not read on the elected embodiment 1, shown in fig. 1) is withdrawn from consideration, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6/6/2005.

### *Drawings*

2. Figures 24a and 24b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (APA).

The APA discloses in figs. 24a and 24b a reverse blocking semiconductor device comprising: a drift layer 3 of a first conductivity type; a MOS gate structure including a base layer 4 of a second conductivity type selectively formed in a front surface region of the drift layer, an emitter region 8 of the first conductivity type selectively formed in a surface region of the base layer, a gate insulation film 6 covering a surface area of the base layer between the emitter region and the drift layer, and a gate electrode 7 formed on the gate insulation film; an emitter electrode 8 in contact with both the emitter region and the base layer of the MOS gate structure; an isolation region 11 of the second conductivity type surrounding the MOS gate structure through the drift layer and extending across an entire thickness of the drift layer; a collector layer 9 of the second conductivity type formed on a rear surface of the drift layer and connecting to a rear side of the isolation region; and a collector electrode in contact with the collector layer; wherein a distance being a distance from an outermost position of an portion of the emitter electrode, the portion being in contact with the base layer, to an innermost position of the isolation region, and a thickness dimension in a depth direction of the drift layer.

The APA lacks anticipation of W being greater than a thickness dimension in a depth direction of the drift layer. However, it would have been obvious to one skilled in the art at the time the invention was made to satisfy the recited limitation, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 2, The APA discloses (par. 0007) a reduced thickness of the drift layer.

As for reducing the drift layer after the formation of the MOS gate structure, it refers to a

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process and "product by process" claims are directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685 and *In re Thorpe*, 227 USPQ 964, 966. Therefore, the way the product was made does not carry any patentable weight as long as the claims are directed to a device. Further, note that the applicant has the burden of proof in such cases, as the above case law makes clear. Also see MPEP 2113.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted art (APA) in view Ogura et al. ("Ogura") USPN 5,463,231.

The APA discloses the device structure as recited in the claim, but lacks anticipation of introducing lattice defects.

Ogura discloses (col. 14, 1-6) a reverse blocking semiconductor device wherein lattice defects are introduced at least in the base layer.

Therefore, in view of Ogura's teachings, one having ordinary skill in the art at the time the invention was made would be motivated to modify the APA by introducing defects in the base since that would improve the turn-on characteristic as taught by Ogura.

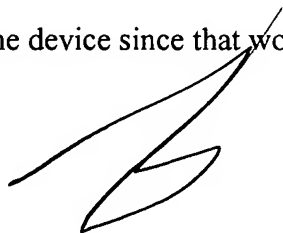
6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over APA as applied to claim 1 above, and further in view of Akiyama et al. ("Akiyama") JP 3-48462.

The combined references disclose the device structure as recited in the claim, but lack anticipation of introducing defects to the front surface.

Akiyama discloses in fig. 1 a reverse blocking semiconductor device wherein defects are being introduced to the front surface of the device to reduce the lifetime of minority carriers.

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Therefore, in view of Akiyama's teachings, one having ordinary skill in the art at the time the invention was made would be motivated to incorporate Akiyama's teachings by introducing defects to the front surface of the device since that would suppress threshold variation as taught by Akiyama.



**NATHAN J. FLYNN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS

June 17, 2005